

U. S. PTO Customer No. 25280

Case #5602

REMARKS

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35 USC Section 103 Rejections:

2. Claims 1 – 6, 12 – 18, 22 – 23, 28, 30, 32, 34 – 35 and 37 were rejected under 35 USC 103(a) as being unpatentable over Nun et al. (US 2003/0147932) in view of Morgan et al. (US 2003/0096083).
3. Claims 10 – 11, 19 – 21, 24 – 27, 29, 31, 33, 36 and 38 – 39 were rejected under 35 USC 103(a) as being unpatentable over Nun et al. (US 2003/0147932) in view of Morgan et al. (US 2003/0096083) and further in view of Soane et al. (USPN 6,607,994).
4. Claims 7 – 9 and 40 – 45 were rejected under 35 USC 103(a) as being unpatentable over Nun et al. (US 2003/0147932) in view of Morgan et al. (US 2003/0096083) and further in view of Yamamoto et al. (US 2004/0202818).

Applicants have amended independent claims 1, 32, 40 and 44 to include the limitation previously contained in claims 6 and 7, i.e. the limitation that the surface of the fiber-containing substrate also includes a repellent component selected from the group consisting of fluorocarbon-containing chemicals, silicones, waxes, and combinations thereof. Applicants have cancelled the remaining independent claims – claims 28 and 34.

Thus, Applicants respectfully submit that rejections #2 and #3, as shown above, have been overcome, since in order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art (MPEP § 2143.03). Applicants respectfully contend that the combination of references in each instance fail to teach that the surface of the fiber-containing substrate also includes a repellent component selected from the group consisting of fluorocarbon-containing chemicals, silicones, waxes, and combinations thereof. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

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With regard to rejection #4 above – Nun in view of Morgan and further in view of Yamamoto:

Examiner's Arguments

With regard to the teachings of Nun, the Examiner states that Nun et al. teach a self-cleaning surface for an article that has a "lotus effect" surface (Abstract) which provides a hydrophobic surface [0003]. The Examiner further states that the applied article taught by Nun's invention may comprise polyurethane fibers [0041]. The hydrophobic surface of the applied article, in this case polyurethane fibers, is created from a plurality of irregularities, such as elevations and/or depressions [0029]. The Examiner also states that Nun teaches that to create these elevations, particles ranging in diameter from 20nm to 100 microns [0035] may be affixed to the surface of the polyurethane fibers [0043]. The particulate may be silica, including fumed silica [0038]. The Examiner also takes the position that the applied reference also encompasses colloidal silica. The Examiner submits that Nun is silent as to the creation of integral surface structures on the surface of the fabric to create the "lotus effect."

With regard to the teachings of Morgan, the Examiner states that Morgan et al. teach a method of creating extremely hydrophobic surfaces that consist of elevations and indentations and that have a hydrophobic layer on their exterior (Abstract). The elevations and indentations may be created via subtractive processes such as fine blasting, embossing, or etching [0027]. The elevations and indentations of the surface have a size in the range of 10nm to 200 microns [0026]. The Examiner takes the position that the elevations and indentations are normal to the plane of the surface of the treated substrate as the outward facing surface is treated via process such as fine blasting, embossing or etching which would result in elevations and indentations normal to the surface of the treated substrate. The invention of Morgan et al. is designed to treat the entire outwardly facing surface that would encounter liquid (Abstract). A second step for production of the hydrophobic surface consists of applying a contour-following coating (repellent) that may serve as corrosion protection or a sealing effect [0031]. This coating serves as a separate repellent layer upon which the nanoparticles of Nun et al. would be attached in the combined article.

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The Examiner submits that since Nun et al. and Morgan et al. are from the same field of endeavor (i.e. super hydrophobic articles), the purpose disclosed by Morgan et al. would have been recognized in the pertinent art of Nun et al. Thus, the Examiner believes it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the article of Nun et al. with the surface modification (i.e. elevations and indentations and coating) of Morgan et al. Thus the skilled artisan would have been motivated by the desire to impart the outer surface of the polyester fabric with greater hydrophobicity. The Examiner also contends that although Morgan et al. do not explicitly teach the claimed feature of a Roughness Factor greater than or equal to about 1.30, it is reasonable to presume that said property is inherent to Morgan et al. Support for said presumption is found in the use of like materials (i.e. polyester fibers with microscopic surface structures). The burden is upon Applicant to prove otherwise. In addition, the Examiner submits that the presently claimed property of a Roughness Factor greater than or equal to 1.30 would obviously have been present once the Morgan et al. product is provided.

With regard to the teachings of Yamamoto, the Examiner submits that Yamamoto et al. teach a method of creating a water and oil-repellent article by treating said article with at least one fluorine-containing compound (Abstract). Fluorine polymers available for application include a fluoroalkyl group-containing (meth)acrylate [0035]. The Examiner further contends that since Nun et al. and Yamamoto et al. are from the same field of endeavor (i.e. hydrophobic articles), the purpose disclosed by Yamamoto et al. would have been recognized in the pertinent art of Nun et al.

Thus, the Examiner submits that it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have coated the article of Nun et al. with a fluoroalkyl group-containing (meth)acrylate motivated by the desire to make the article more hydrophobic.

Applicants' Arguments

Applicants respectfully submit that there is no motivation, or apparent reason, to combine Nun with Morgan and Yamamoto. Additionally, Applicants respectfully submit that, even if the combination were made, there is no reasonable expectation of success that modifying the fiber or fabric of Nun with the processes taught by Morgan and the chemical treatment taught by Yamamoto would result in Applicants' claimed invention.

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The MPEP (Section 2143) states:

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Case law supports this statement in that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." Additionally, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination. *In re Mills*, 916 F.2d 860, 16 USPQ2d 1430, 4132 (Fed. Cir. 1990).

Nun teaches the addition of hydrophilic antimicrobial particles and hydrophobic particles (e.g. silica and metal oxides) to surfaces such as polymers, metals, wood, leather, fibers, fabrics, glass and ceramics [0034; 0039; 0041]. The resulting surfaces exhibit long lasting antimicrobial properties (Abstract) which are ideal for use in marine applications, building materials, outdoor structures, electrical sheathing, etc. [0061].

Morgan teaches modifying the entire area of a surface structure by fine blasting it with abrasive particles, embossing, or etching [0027; 0078]; wherein the surface structures are comprised of metal, ceramic or polymer materials [0028]. The process, which provides a uniform treatment to the whole surface structure, appears to actually remove some of the surface structure in order to obtain elevations and indentations, i.e. it is a subtractive process. The resulting surface structures exhibit hydrophobic properties which are ideal for use in containers which hold liquid, e.g. ketchup bottles, honey containers, etc. (Abstract).

Yamamoto et al. is directed to fluorine-containing compositions and methods for imparting oil and water repellent properties to a textile substrate (Abstract). The compositions are ideal for use as a carpet treatment [0001].

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Applicants respectfully submit that there is no motivation or apparent reason that one of ordinary skill in the art would reasonably be lead to combine substrates treated with both hydrophilic antimicrobial particles and hydrophobic particles with fine blasting processes for improving the pouring behavior of liquid from containers and further with fluorine-containing compositions for textile substrates.

Furthermore, Applicants claim, in part, a fiber-containing substrate "having integral microscopic surface structures upon at least a portion of at least one of its surfaces, wherein said integral microscopic surface structures have projections substantially normal to the plane of said fiber-containing substrate, said at least one surface comprised of portions having a plurality of substantially unbroken fibers." Such morphological features on the surface of the fiber-containing substrate result from exposure of the substrate to a textile face-finishing process. There is no "subtractive" process that blasts and etches away the surface in order to obtain the "integral microscopic surface structures."

Also, by the very nature of fiber-containing substrates, Applicants' substrates are formed in such a way that the entire area of the surface of the substrate cannot be treated by morphology changing processes, as is taught by the combination of references. More specifically, fiber-containing substrates are formed by weaving, knitting, and nonwoven production processes that lay some fibers on top of other fibers in a certain arrangement. Thus, some fibers contained therein are not exposed to the surface treatment because they are hidden from the treatment process, due to the construction of the fiber-containing substrate. As a result, Applicants respectfully assert that the treatment process taught by Morgan, wherein the entire surface of the substrate is treated in order to obtain a hydrophobic surface, would not be possible for the fiber-containing substrate claimed by Applicants.

Accordingly, Applicants respectfully submit that, even if the combination suggested by the Examiner is made, there is no reasonable expectation of success that such a combination would result in Applicants' claimed invention.

Thus, Applicants respectfully submit that there is no motivation or apparent reason to combine the references as suggested by the Examiner based on the assertion that (a) Morgan teaches uniform surface treatment to plastic, ceramic or metal surfaces for improving the pouring behavior of liquids from containers, (b) Nun teaches the addition of hydrophilic antimicrobial particles and hydrophobic particles to fibers or fabrics, and (c) Yamamoto teaches fluorine-containing repellent compositions for textile substrates. Applicants further assert that, even if the combination suggested by the Examiner

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is made, there is no reasonable expectation of success that such a combination would result in Applicants' claimed invention.

As an additional note, Applicants respectfully submit that the Examiner's assertion in the Final Office Action (dated 3/29/07) that Morgan teaches a "repellent" at [0031] is incorrect (see page 3 of the Final Office Action). Morgan teaches a contour-following coating and never mentions the word "repellent," as asserted by the Examiner. The Examiner says that this coating serves as a separate "repellent layer" upon which the nanoparticles of Nun et al. would be attached in the combined article. Such an interpretation by the Examiner is improper, since Morgan fails to explicitly state "repellent" in describing the contour-following coating. Applicants respectfully submit that the Examiner is interpreting the teachings of Morgan using hindsight reconstruction in order to reject the claims. Applicants respectfully submit that such interpretation is improper.

Conclusion:

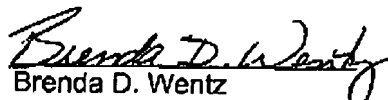
For the reasons set forth above, it is respectfully submitted that all claims now stand in condition for allowance.

Should any issues remain after consideration of these Remarks and Amendments, the Examiner is invited and encouraged to telephone the undersigned in the hope that any such issue may be promptly and satisfactorily resolved.

In the event that there are additional fees associated with the submission of these papers (including extension of time fees), authorization is hereby provided to withdraw such fees from Deposit Account No. 04-0500.

Respectfully requested,

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